

Executive Summary

The Lake Tahoe Basin Management Unit (LTBMU) proposes to reduce the risk of high intensity wildfire on National Forest System lands in the wildland urban interface (WUI) in order to provide a defense zone between the Forest and urban and/or suburban development. Removing surface and ladder fuels in the WUI would provide space for an oncoming crown fire to drop to a surface fire where deployment of hand crews could be expected to succeed in controlling the spread of the fire. Equally important is thinning trees to achieve forest density more resistant to drought, insects, and disease which is included in the action alternatives, along with removal of conifer encroachment in riparian areas, aspen groves, and meadows. The action alternatives were developed using the best available science and are in compliance with, and would implement, the direction in the LTBMU Forest Plan, including amendments.

Background

Project Area

The South Shore project analysis area extends from Cascade Lake on the northwest to the Heavenly Mountain Resort special use permit boundary and the Nevada State line on the northeast, and from Lake Tahoe on the north to the LTBMU boundary on the south. The table below lists the acres by ownership in the project analysis area.

Table ES-1. Acres of Ownership in Project Analysis Area

Ownership	Acres
Private Ownership	8,088
Water and Other (State, County)	8,121
National Forest System lands	70,581
Total Project area, all ownerships	86,790

LTBMU Fuels and Healthy Forest Restoration Direction

The Healthy Forest Restoration Act of 2003 (HFRA) authorizes projects on federal lands to reduce fuel loads and increase or maintain healthy forest conditions. It provides a foundation to work collaboratively with at-risk communities to reduce wildfire hazards caused by fuel loads within the wildland urban interface (WUI) that exceed desired conditions as defined by the Forest Plan (Sec.102 (b)). The Act requires federal agencies to consider recommendations made by at-risk communities that have developed community wildfire protection plans (Sec. 101 (3)). An updated list of wildland urban interface communities within the vicinity of federal lands that are at high risk from wildfire was published in the *Federal Register* on August 17, 2001. The community of South Lake Tahoe is listed in the Federal Register as a community at-risk. The South Lake Tahoe Fire Department, Lake Valley Fire Protection District, Tahoe Douglas Fire Protection District, and Fallen Leaf Fire Department have developed Community Wildfire Protection Plans (CWPPs).

Coordination and collaboration with CWPPs are important parts of the HFRA analysis for this project. The community fire safe councils worked with corresponding fire departments and fire protection district personnel to design these CWPPs for effective defensible space across all land

ownerships, including National Forest System lands. The LTBMU collaborated with the fire districts and fire safe councils to design fuel reduction activities that coordinate with the CWPPs and provide the defensible space identified in the CWPPs where it occurs on National Forest System land.

The LTBMU, State, and local agencies have reduced fuel hazards on approximately 18,000 acres from 2000-2010. In 2007, Tahoe Regional Planning Agency (TRPA) published their Fuel Reduction and Forest Restoration Plan for the Lake Tahoe Basin WUI. This report synthesizes the CWPPs for the seven fire protection districts (FPD) to identify Basin-wide fuel reduction needs and the resources needed to implement a Basin-wide hazardous fuels reduction Plan. The TRPA report states “Although 18,000 acres have been treated in the Lake Tahoe Basin since 2000, increased efforts are needed to protect values at risk and restore forest health” (Fuel Reduction and Forest Restoration Plan for the Lake Tahoe Basin WUI, Executive Summary, pg. E-4, TRPA, 2007).

Existing Situation

A major public concern in the Lake Tahoe Basin is the threat of catastrophic fire. The cessation of Native American burning practices followed by Comstock-era logging, in addition to over 60 years of fire suppression in the Basin have resulted in dense forests susceptible to fires that would burn severely and result in a high incidence of tree mortality. The combination of large amounts of hazardous fuels and the Tahoe Basin having one of the highest ignition rates in the Sierra Nevada, particularly in urban areas, contributes to the risk of a devastating wildfire (Murphy & Knopp 2000, pg. 435). The LTBMU Stewardship and Fireshed Assessment used basin-wide fire modeling to evaluate the likely effects of unplanned fires on urban areas and found that the most severe fires, and therefore effects, would occur in lower elevation pine and mixed conifer forests (Ten-year Integrated Vegetation and Fuels Management Program of Work, USDA Forest Service, 2007, unpublished). Crown fires are not easily controlled and could result in potential loss of life, loss of private property, significant impacts on natural resources, including lake clarity, and adverse effects to recreational opportunities and tourism (TRPA 2007, Executive Summary, pg. E-1). The wildfire behavior predicted by the Fireshed Assessment, the Lake Tahoe Watershed Assessment, the TRPA Fuel Reduction and Forest Restoration Plan, and the South Shore Landscape Analysis were verified by the intensity and severity of the 2007 Angora Fire.

Purpose and Need for Action

1. Improve Defensible Space –

There is a need for defensible space adjacent to communities (on National Forest System lands) in the South Shore area where fire suppression operations can be safely and effectively conducted in order to protect homes and communities from wildfires. (Citygate Associates 2004; Community Wildfire Protection Plan for Lake Valley Fire Protection District, 2004; Community Wildfire Protection Plan for Fallen Leaf Fire Department, 2004, Tahoe-Douglas 2004; Murphy and Knopp, eds. 2000a; USDA FS LTBMU 2004; TRPA 2007; USDA FS LTBMU 2007a).

2. Reduce Risk of Catastrophic Wildfire –

There is a need to reduce tree density and surface fuel loading, because stands of trees have become overly dense and surface fuels have accumulated to such a degree that wildfires with sustained crown fire and long range spotting could quickly develop. This causes severe resource damage and threatens human life and property. Figure 3 provides an example of what this condition looks like.

3. Improve Forest Health –

There is a need for restoration of forest health in the South Shore area where stands of trees have become overly dense, which subjects them to widespread forest dieback from insects and diseases. In addition, forest stands that are overly dense suffer stress from drought and competition for nutrients. (Murphy and Knopp, eds. 2000a; USDA FS LTBMU 2004; TRPA 2007; USDA FS LTBMU 2007a). Existing overcrowded stands have higher than average mortality which leads to ever-increasing fuel loads and high intensity wildfire risk.

4. Improve SEZ Vegetation and Habitat –

There is a need for restoration of stream environment zones (SEZs), including aspen stands in the South Shore area, in order to reduce the potential for catastrophic wildfire to spread through these areas. There is also a need to promote maintenance of meadows and aspen stands consistent with the Forest Plan, in addition to the LTBMU and Pacific Southwest Research Station's "Aspen Community Mapping and Condition Assessment Report". There is also a need to provide habitat for wildlife and plant species that are dependent on SEZs and/or aspen (Shepperd et al 2006). The photo in Figure 4 is an example of aspen treatment and SEZ desired conditions for the South Shore project.

To meet the aforementioned needs for action, the proposed action would also be consistent with Forest Plan direction, desired conditions within the WUI and achieve the following purposes:

- Maintain or improve habitat conditions for threatened, endangered, and Forest Service sensitive species of plants and animals, consistent with the Forest Plan. Within the WUI defense zone, and strategic area treatments of the WUI threat zone, achieve management direction for the desired condition of forests that "are fairly open and dominated primarily by larger, fire tolerant trees" (SNFPA pg. 40, USDA FS 2004b, (Murphy and Knopp, eds. 2000a; USDA FS LTBMU 2004).

- Assure that treatments in SEZs promote the success of riparian species while providing for coarse woody debris recruitment and stream shading needs. (SNFPA pg. 64, USDA FS 2004b).
- Protect water quality consistent with the Forest Plan, the requirements of the Clean Water Act, and the Lake Tahoe Basin Plan.
- Reduce the risk for negative impacts to soil productivity and water quality from wildfire.
- Meet scenic quality objectives and stabilize scenic resources over the long-term by reducing the risk of impacts from wildfire and achieving the desired condition of stands that “are fairly open and dominated primarily by larger, fire tolerant trees.” See Figure 5 for a before and after comparison of current and desired stand conditions.
- Meet air quality standards for the Lake Tahoe Basin by reducing the risk of impacts from wildfire.
- Discourage post-treatment establishment of user-created motorized or non-motorized routes or trails.
- Address public safety during implementation of the project.

Public Involvement

The proposed action was developed through coordination and collaboration with the Washoe Tribe of Nevada and California, the City of South Lake Tahoe Fire Department, Lake Valley Fire Protection District, Tahoe Douglas Fire Protection District, Fallen Leaf Fire Department, Lahontan Water Board, Tahoe Regional Planning Agency (TRPA), and the public during a series of meetings during February and March of 2007. The proposed action was mailed to interested and affected parties in July of 2007. Field trips to a series of three sites for an on-the-ground look at types of areas proposed to receive fuel treatments by the South Shore project were hosted by members of the interdisciplinary team on a Tuesday and a Saturday in August of 2007, along with an evening open house to provide the public an opportunity to ask questions and gather information about this project. A total of seven written comment letters were received.

This initial scoping and preliminary environmental analysis phase revealed that there was uncertainty regarding the scope of effects from this project on the human environment largely due to the comparatively large area proposed for treatment. Therefore the responsible official elected to prepare a joint draft environmental impact statement/draft environmental impact report (DEIS/DEIR) in accordance with NEPA and CEQA.

Scoping for the DEIS/DEIR was done in accordance with 40 Code of Federal Regulations (CFR) part 1501.7 – Scoping. The notice of intent to prepare an EIS was published in the *Federal Register* on January 16, 2008. The notice of public scoping meeting, notice of intent, and CEQA-required notice of preparation, notice of completion, site map, and a supplemental potential environmental effects and mitigations measures paper were mailed to the State clearinghouse, responsible agencies and interested persons. One letter was received in response to this scoping period. Two joint Lahontan Water Board and Forest Service scoping meetings were held.

There were no substantive changes to the proposed action initially scoped in July 2007. Scoping comments submitted previously on this project were retained and treated the same as those received subsequent to the publication of the notice of intent and notice of proposal.

The Notice of Availability for the Draft EIS/EIR was published in the Federal Register and a legal notice was published in the Tahoe Daily Tribune on April 10, 2009. The 45-day comment period closed on May 26, 2009. Copies of the Draft EIS/EIR were mailed to the interested and affected public, as well as to required federal and state agencies on March 26, 2009.

Twenty comment letters were received. The response to comments is contained in Appendix E.

Issues

Scoping comments from the public, other agencies, and the Washoe Tribe of Nevada and California provided information used to define issues and formulate possible alternatives to the proposed action that responded to the issues. The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues are defined as concerns as to the effects that would be caused by implementing the proposed action that require additional alternative development to insure a reasoned decision can be made. Non-significant issues are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in 40 CFR, part. 1500, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons why they were found to be non-significant may be found in the South Shore project record, document E-2. Significant issues that were identified from the comments received during scoping on the proposed action are given below. These were used to frame alternatives.

Issue: Watershed Impacts

There was a concern whether implementation of the proposed action would result in adverse direct, indirect and/or cumulative effects to watershed conditions. Commenters expressed concern that the proposed action resulted in a risk to water quality and watershed condition due to the extent of the area and/or method of treatment in or near sensitive areas. There was particular concern about the cumulative effect of proposed activities in watersheds (HUC7) where the equivalent roaded acres (ERA) already exceed the threshold of concern (TOC).

How this issue was addressed:

An alternative to the proposed action was created (Alternative 3) which reduces the amount of total acres proposed for treatment. In addition, Alternative 3 proposes fewer acres of mechanical treatment methods shifting treatment to hand thinning. Proposed changes are primarily in sensitive areas (e.g stream environment zones). Changes in the amount and method of treatment resulted in corresponding changes in the follow up treatments such as the amount of prescribed burning. In response to the concern regarding the watersheds that already are over the TOC, Alternative 3 also redistributes the treatment acres proposed in each of these watersheds over all the years of the project as compared to the proposed action to reduce the maximum treatment acres in these watersheds in a given year, thereby reducing cumulative impacts.

Issue: Wildlife Areas

There was a concern that fuel reduction activities that reduce canopy closure would degrade California spotted owl and northern goshawk nesting and foraging habitat.

How this concern was addressed:

Alternative 3 responds to this concern by changing treatments based on evaluation of the following: spatial extent of northern goshawk and California spotted owl PACs, WUI zone (defense or threat), type of treatment proposed (mechanical or hand), stand survey data, and type of fire behavior predicted. Generally, the intensity of treatments proposed was reduced in PACs where models showed existing conditions were predicted to support only surface fires. There is one less PAC treated in Alternative 3.

Alternatives Considered in Detail

The three alternatives developed, (1, 2, 3) consider a full range of reasonable management options, including the No Action and Proposed Action alternatives.

In **Alternative 1**, the No-Action alternative, no vegetative treatments would take place and ladder and surface fuel loads would continue to increase. The Forest and private property would continue to be at risk for high-intensity crown fire.

In **Alternative 2**, the Proposed Action alternative, the Forest Service proposes 10,670 acres of vegetative treatments to reduce hazardous fuels. Most of the South Shore project acres will require activities extending over a period of three to seven years after initial treatment to attain fuel reduction conditions that would remain within desired condition for a period of 15 to 20 years post treatment. Hazardous fuel reduction would occur in all three zones of the WUI: on National Forest-owned urban lots within the urban core of the WUI, on National Forest lands within the ¼ mile WUI defense zone extending from the urban core, and on National Forest lands within the 1¼ mile WUI threat zone extending from the defense zone. Most areas would require two connected treatments, the first to remove trees and the second to reduce surface fuels.

Providing healthy wildlife habitat and restoration of a forest structure with increased resistance to drought, disease, and insects are objectives that also reduce hazardous fuels. The South Shore project includes objectives for tree spacing and basal area to increase forest health while retaining larger trees and emphasizing retention of Jeffrey/ponderosa and sugar pine species. Restoration and maintenance of meadows and aspen stands would be accomplished by removal of encroaching conifers, mainly lodgepole pine and white fir.

In **Alternative 3**, the Preferred Alternative is a modification of the Proposed Action. Vegetative treatments 10,112 acres would reduce hazardous fuels. This alternative was developed to address the issues raised in public scoping concerning watershed and wildlife effects. Alternative 3 provides an action alternative that reduces environmental effects to the extent practical while meeting the purpose for the project and concerns for public health and safety. Alternative 3 reduces impacts to watersheds and wildlife while meeting the purpose and need to effectively reduce fire risk in the WUI. In summary, environmental effects are reduced through a reduction in mechanical treatment units, a reduction in whole-tree mechanical units, an increase in cut-to-length units, an increase in hand thinning units, and an overall reduction in total project acres compared to Alternative 2.

Comparison of Alternatives

This section provides a comparison of the alternatives, based on the proposed activities in each alternative, of how each alternative meets the Purpose and Need, how the alternatives respond to the significant issues, and the effects of implementing each alternative as represented by several key resources.

Comparison Table

Table ES-2. Comparison of Alternatives

Alternative 1 (No-Action)	<p>Risk of high intensity wildfire would continue to increase as fuel continues to accumulate.</p> <p>No treatments would occur to reduce surface or ladder fuel loads.</p> <p>Overly dense forest conditions would contribute to tree mortality and continue to reduce resistance to drought, insects, and disease.</p> <p>Forest conifer species composition would continue trending toward white fir and lodgepole pine, with continuing loss of Jeffery, Ponderosa and sugar pines.</p> <p>Conifer encroachment would continue in meadows and riparian areas.</p> <p>Aspen stands at high risk for loss are likely to be lost to continued conifer encroachment.</p> <p>Two stream crossings currently causing resource impacts would not be repaired or improved.</p>
Alternative 2 (Proposed Action)	<p>Risk of high intensity wildfire would be reduced by treating surface and ladder fuels on 10,671 acres.</p> <p>Thinning would reduce basal area to densities that would increase resistance to drought, insects, and disease.</p> <p>Preferential retention of Jeffery, Ponderosa, and sugar pines would improve species composition toward the pre-settlement estimates of 50% pine.</p> <p>Meadow and riparian vegetation would recover as conifer encroachment is reduced.</p> <p>Aspen stands at high risk of loss would recover as conifer encroachment is reduced or removed.</p> <p>Two stream crossings currently causing impacts to water and fish passage would be replaced and improved</p>
Alternative 3 (Preferred Alternative)	<p>Risk of high intensity wildfire would be reduced by treating surface and ladder fuels on 10,112 acres.</p> <p>Other items in Alternative 2 would apply to Alternative 3, but on fewer acres.</p> <p>Watershed impacts would be less than Alternative 2.</p> <p>Fewer acres of wildlife PACs would be thinned than Alternative 2.</p> <p>Fewer miles of roads would be needed than in Alternative 2.</p> <p>Mechanical treatment acres would decrease, hand thinning would increase.</p>

Alternative Response to the Purpose and Need and Issues

This section provides a summary of how the alternatives respond to the purpose and need, and issues, discussed in Chapter 1 of the DEIS.

The key elements of the Purpose and Need are:

- There is a need for defensible space adjacent to communities in the South Shore area where fire suppression operations can be safely and effectively conducted in order to protect homes and communities from wildfires.

- There is a need for restoration of forest health in the South Shore area where stands of trees have become overly dense and surface fuels have accumulated to such a degree that wildfires with sustained crown fire and long range spotting could quickly develop, causing severe resource damage and threatening human life and property. In addition, forest stands that are overly dense often suffer stress from drought and competition for nutrients, which subjects them to widespread forest dieback from insects and diseases.
- There is a need for restoration of meadows and aspen stands in the South Shore area in order to reduce the potential for catastrophic wildfire to spread through these areas, and to promote maintenance of meadows and aspen stands.

By maintaining the existing condition, Alternative 1, the no action Alternative, fails to provide defensible space adjacent to homes, businesses or communities. Alternative 1 perpetuates the existing forest density and the likelihood for high-intensity sustained crown fires causing severe resource damage and threats to human life and property. Ongoing mortality from drought, as well as dieback from disease and insects would continue or increase from current levels. Meadows with conifer encroachment are likely to experience lowering water tables and shrink in size as conifer encroachment continues. Riparian areas with conifer encroachment are likely to continue to see loss of vigor in riparian vegetation, and aspen stands at high risk for loss are likely to die out from conifer competition.

Alternatives 2 and 3 both meet the key elements of the purpose and need. Both action alternatives would provide defensible space where fire suppression actions could be effective in protecting homes and communities from wildfire. Thinning overly dense stands would change fire behavior from a sustained high intensity crown fire to a surface fire in most areas. Thinning would reduce tree competition and improve forest health which would increase forest resistance to drought, insects, and disease. Removal of conifers that are encroaching on meadows and riparian areas would maintain or improve riparian vegetation vigor and water tables. Aspen stands where conifer encroachment is removed would show increased vigor and regeneration. The main differences between the two action alternatives are the acres treated, the treatment methods, and the environmental consequences. Acres and methods are displayed in table E-3; a discussion of the differences in environmental consequences for key resources follows.

Table ES-3. Fuel Treatment Methods by Alternative

Treatment Type	Alternative 2 Acres	Alternative 3 Acres	Difference Acres
Hand Thinning	4,942	5,962	1,020
Cut-To-Length	1,910	2,010	100
Whole Tree	3,818	2,140	-1,678
TOTAL	10,670	10,112	-532

Key Resource Areas

Direct, indirect, and cumulative effects were analyzed for each resource area potentially affected by the alternatives. The following is a summary of the effects for these resource areas. The resource area effects discussed below are those raised by the public during scoping, or are resource areas with distinctive differences in effects between alternatives. This summary is not meant to capture all of the effects analyses for all resources. The detailed description of effects to resources resulting from implementation of each of the alternatives is provided in Chapter 3.

Fire and Fuels

The No Action alternative would be expected to result in increased surface and ladder fuel levels throughout the South Shore project area, and wildfire would be expected to result in sustained high-intensity crown fire in the majority of the area.

Both Alternative 2 and 3 would reduce surface and ladder fuel loads and change fire behavior to a surface fire in the majority of the project area. Alternatives 2 and 3 would combine with other fuel reduction efforts to provide a functional defense zone for homes and communities. Both action alternatives would reduce flame lengths to enable wildfire suppression efforts to be successful.

Thinning small and suppressed trees in the action alternatives would reduce the risk of mortality for larger, more fire-resistant trees. The result would be more open forest conditions where fire could be allowed to play its ecological role.

Alternative 2 treats more acreage than Alternative 3, and therefore changes fire behavior on more acres. Alternative 3 would have a shorter effective time frame because it contains more hand-thinned acres that would not remain effective for the same length of time as mechanical thinning.

Forest Vegetation

Alternative 1 makes no changes to either vegetation structure or composition. Stress-related mortality would be expected to continue from competition in over-crowded stands, along with low resistance to drought, insects, or disease. The current trend for pine species to decrease would continue, with a corresponding increase in white fir and incense cedar, resulting in a forest with a lower tolerance for fire and drought. The decline of aspen and riparian shrub species caused by conifer encroachment would continue.

The action alternatives, 2 and 3, would reduce stand mortality by reducing stand density to sustainable levels. Increased spacing between trees would reduce competition for water and nutrients and help reduce the spread of insects and disease. Removal of the shade-tolerant fir and cedar, while retaining Jeffery, ponderosa, and sugar pines, would begin to restore the ecological species balance in the South Shore area. Removal of conifers encroaching into meadows would reverse the loss of meadow vegetation and maintain or enhance meadow water tables. Removal of conifers encroaching into riparian areas would encourage riparian vegetation growth and retention of water tables. With removal of encroaching conifers, aspen stands currently at risk of loss from overtopping and competition from conifers would respond with new growth. Alternative 2 produces these effects on more acres than Alternative 3.

Soil Resources

The No Action alternative would produce no direct effects to soils, however, because fire risk is increased for Alternative 1, the risk for detrimentally burned soils is also increased.

Effects for soils from the action alternatives would differ both because of the amount of acres treated and the treatment methods. Alternative 2 operates on more acres, uses more whole-tree

mechanical methods, more skid trails, and more roads than Alternative 3, which gives Alternative 2 a higher potential for soil compaction. Alternative 2 uses more landings with more large landing burn piles with the potential for compaction and detrimentally burned soils under these large burn piles. Alternative 3 reduces total acres, uses more cut-to-length mechanical methods which operate on a bed of slash that reduces soil compaction, and includes a greater proportion of hand-thinning methods which also reduce the potential for soil compaction. There are fewer large landing burn piles with Alternative 3, but more small hand burn piles. This also reduces the potential for detrimentally burned soil because although there are more piles to burn, the burn temperatures, duration of the burn, and penetration of heat into the ground are less with the smaller hand piles. Alternative 3 has a lower potential for negative effects to soils than Alternative 2.

Water and Riparian Resources

The No Action alternative would produce no direct effects to water quality, however, because fire risk is increased for Alternative 1, the risk for negative effects to watersheds and water quality is also increased. Modeling of watershed effects from wildfire projected wildfire effects to be 3 to 5 times greater than either action alternative depending on wildfire severity.

Similar to soils resources, effects for water and riparian resources from the action alternatives differ both because of differences in the amount of acres treated and the treatment methods. Alternative 2 operates on more total acres, and more acres within streamside environment zones (SEZs) using mechanical equipment than Alternative 3. Additional roads would be needed, and together with skid trails and landings, the disturbance levels in Alternative 2 would increase the risk ratio (RR) to a larger degree on more watersheds than Alternative 3. Although neither action alternative would cause any watershed to be pushed over 100% of their threshold of concern (TOC), Alternative 2 would increase the RR more than 20% for both Tallac and Taylor Creek watersheds. Alternative 3 has a decrease in mechanical treatment acres and an increase in hand thinning acres, especially in SEZs, which reduces ground disturbance levels close to streams and lakes. Alternative 3 also requires fewer roads, landings, and skid trails, resulting in less ground disturbance. The changes for Alternative 3 reduce the increase in TOC for both Taylor and Tallac Creek watersheds below 20%. The Camp Richardson Frontal watershed is currently over 100% TOC due to urban development, and both action alternatives increase the TOC more than 5% in order to effectively reduce fuels in this watershed. Public comments on the watershed effects of the Proposed Action were a major factor in developing Alternative 3, along with public comments on wildlife effects.

Aquatic Wildlife

The No Action alternative would produce no direct effects to aquatic wildlife. However, because fire risk is increased for Alternative 1, the risk for negative effects to aquatic wildlife habitat from ash and sediment, as well as direct fish kill, is also increased. Under the No Action alternative conifer stands within riparian conservation areas (RCAs) and SEZs will continue to remain dense with high fuel loads. Fire model simulations across the South Shore project area showed a distribution of low burn severity (4%), moderate severity (62%) and high severity (32%). It is assumed in case of wildfire under existing conditions that a portion of the potential high severity areas would be distributed in the RCAs/SEZs. Wildfire impacts could occur to riparian vegetation, which in-turn may affect stream channel stability if vegetation was no longer available to provide bank stability.

Both Alternative 2 and 3 would reduce conifer density in RCAs and SEZs adjacent to aquatic habitats which could reduce stream shading. Neither alternative is expected to reduce stream shading to an extent that would result in an increase in the temperature regime of streams. Both

alternatives would reduce conifer encroachment and encourage riparian shrub growth to enhance aquatic habitat quality. Alternative 3 affords greater protection for aquatic habitats with an increase in hand treatments in SEZs and a wider buffer for lake shores.

Lahontan cutthroat trout (LCT), a Threatened species, are known to occur in the Upper Truckee River above Christmas Valley upstream of the southern extent of activities in the South Shore project area. This adjacent Lahontan cutthroat trout population could be affected by the project if individual LCT migrate into the project area before implementation occurs. By decreasing the amount of combustible fuels within Upper Truckee River RCAs/SEZs the potential for future effects on LCT resulting from wildfire would decrease.

Terrestrial Wildlife

The No Action alternative would produce no direct effects to terrestrial wildlife. However, because fire risk is increased for Alternative 1, the risk for destruction of terrestrial wildlife habitat from high-intensity sustained crown fire is also increased.

Alternative 2 would reduce fuels in wildlife areas, including PACs, where surface and ladder fuels exceed the desired conditions for the WUI. Under either action alternative scheduling would provide refuge areas during activities. Public comments on wildlife effects of the Proposed Action were another factor in developing Alternative 3, along with comments about watershed effects. In the development of Alternative 3, individual stands within PACs were modeled for fire behavior, and those stands that modeled as a surface fire were dropped from treatment. Stands where fire behavior modeling indicated a crown fire type were retained for fuel reduction. The result is that Alternative 2 would have slightly less risk of crown fire, but more reduction in the quality of wildlife habitat, while Alternative 3 would have a slightly increased risk for crown fire over the landscape, but would maintain more high quality wildlife habitat, especially nesting habitat for CA spotted owls and northern goshawks. Neither action alternative would lead toward a trend toward listing for any terrestrial wildlife candidate or Forest Service sensitive species. Details and discussion of other species are found in Chapter 3.

TRPA Special Interest Species

The No Action alternative would produce no direct effects to TRPA special interest species. However, because fire risk would increase for Alternative 1, the risk for habitat loss from high-intensity wildfire would also increase.

Both action alternatives would improve habitats for TRPA special interest species, both by reducing surface and ladder fuels, and by removal of conifer encroachment from meadows, riparian areas, and aspen stands. Northern goshawk TRPA disturbance zones prescriptions would retain habitat components needed by goshawks while reducing surface and ladder fuels, and are also considered as a Forest Service sensitive species. Both Alternative 2 and 3 retain existing winter roost trees within bald eagle winter habitat and all existing nest, roost, and perch trees for osprey while removing surface and ladder fuels. Critical deer fawning habitats within meadows would be improved with meadow improvement for both action alternatives, while forest hiding cover would be reduced by the removal of ladder fuels. Removal of encroaching conifers adjacent to wetlands would maintain or enhance water tables for waterfowl as well as increase sight distance for avoiding predators. BMPs and design criteria would conserve lake and stream fish habitats in the project area. The potential for fine sediment reaching the lake is greater in Alternative 2 than Alternative 3 because Alternative 2 has more acres of mechanical treatment and uses more road miles. However, any increases in fine sediment would not be measurable under either of the action alternatives. See Aquatic Wildlife above for Lahontan cutthroat trout. Summer nesting habitat would not be affected for either the bald or golden eagle. Indirect impacts to peregrine falcons may include slight changes in patterns of habitat use by prey species, subtly

changing peregrine foraging behavior, though overall prey abundance is not expected to be affected by any of the alternatives.

Management Indicator Species

Alternative 1 would produce no direct effects to any management indicator species or their habitats. However, because fire risk is increased for Alternative 1, the risk for loss of MIS habitats from sustained crown fire is also increased.

Effects for riverine, wet meadow and riparian habitats are covered above under water and riparian resources, vegetation, and aquatic wildlife.

There are effects to conifer habitats for MIS species not covered in other resource areas above. Because most treatments proposed under the action alternatives would focus on removal of understory, small diameter trees, and retention of larger trees within the stand, treatments are expected overall to result in an increase in the average tree diameter per stand, and a decrease in both understory tree cover and overall vertical vegetation structure. The net effect is to create a shift in habitats from early- and mid-seral habitats to open canopy late-seral habitats. Direct and indirect effects from Alternatives 2 and 3 to understory shrub canopy closure are primarily a short term reduction in total shrub cover due to one or several of the following: 1) physical disturbance of shrubs from equipment use during mechanical thinning operations, 2) removal of shrubs to create landings, 3) purposeful burning of shrubs during underburning treatments, or 4) incidental burning of shrubs during pile burning treatments. Shrub cover reduction resulting from vegetation treatments would be expected to recover within 3-10 years, with regrowth dependent on the dominant shrub species, treatment type, and site conditions. Due to vegetation treatments some early- and mid-seral coniferous forest would change to late-seral open and closed canopy coniferous forest.

Vegetation management projects remove snags in green forests only when necessary to meet fuels reduction or safety objectives. On average, both action alternatives would retain a minimum of 3-8 medium to large snags per acre, per Forest Plan guidelines and project resource protection measures. These levels of snag retention are within the range of average snag densities observed across the Sierra Nevada bioregion. Removal of snags > 30 inches dbh is limited in both action alternatives, and would have minimal effect on large snag densities in burned forest in the wildlife analysis area; since only hazard trees would be removed adjacent to established infrastructure (e.g., houses, roads/trails, etc). Because burned forests contain higher snag densities than green forests in the wildlife analysis area, the potential reduction in snag density within burned forest would be greater than the reduction in green forest.

Neither action alternative would cause a change in the existing trend for MIS habitats in the Sierra Nevada bioregion, nor would either action alternative modify the existing distribution for any associated MIS species.

Sensitive Plants

Alternative 1 would produce no direct effects to any sensitive plant species or their habitats. However, because fire risk is increased for Alternative 1, the risk for loss of sensitive plants or their habitats from high-intensity wildfire is also increased.

Both action alternatives would protect sensitive plant populations by avoiding flagged areas during all ground-disturbing activities. Sensitive plant habitat would be enhanced by protecting water tables through removing conifers encroaching on their habitats, especially wet meadow and fen habitats.

Noxious Weeds

Alternative 1 would produce no direct effects to any noxious or invasive plant species. However, because fire risk is increased for Alternative 1, the risk for spread of invasive plants and creation of new infestations of noxious/invasive plants from high-intensity wildfire is also increased.

Both action alternatives contain resource protection measures to prevent the introduction and/or spread of invasive plants by avoidance of weed-infested areas and washing equipment before it is allowed into a new area if it is coming into the Lake Tahoe Basin, is coming from a known weed-infested site, or if the originating location is unknown. There is no difference in these features between the action alternatives.

Air Quality

The No Action alternative would produce no direct effects to air quality in the Lake Tahoe Basin. However, because fire risk is increased for Alternative 1, the risk for negative impacts to air quality and human health from high-intensity wildfire is also increased, as is the release of CO₂ and other greenhouse gases.

For either action alternative, all prescribed burning would be coordinated with the state and local air quality agencies to ensure that atmospheric stability and mixing heights are advantageous for dispersion of emissions. El Dorado County Air District is the permitting agency for a required smoke management plan. The smoke management plan would prescribe weather conditions (mixing heights and transport winds) that would avoid smoke effects as much as possible in the City of South Lake Tahoe and other communities in the South Shore projects area, and Desolation Wilderness, a Class 1 airshed.

Pile burning and prescribed burning under either action alternative affects air quality in ways similar to wildfires; however, prescribed burning offers many advantages over wildfire. The effects of prescribed fire can be manipulated to reduce adverse effects to air quality. Smoke mitigation techniques include consideration of atmospheric conditions, season of burn, fuel and duff moisture, diurnal wind shifts, appropriate ignition techniques and rapid mop-up. These procedures would be followed and identified in burn plans to prevent adverse air quality effects. Short duration production of smoke and associated emissions would occur during pile and understory burning. In comparison to a wildfire, prescribed burning produces much less smoke, and would release much less CO₂ and other greenhouse gasses.

Fugitive dust could result from thinning operations such as skidding and hauling during dry seasons in either action alternative. Fugitive dust caused by construction and use of unpaved roads can produce PM₁₀ in quantities great enough to impair the visual quality of the air. Dust that is generated by skidding, loading, and site preparation activities also contributes to fugitive dust. These effects are localized and would be mitigated by effective dust abatement methods through contractual requirements for standard road watering to mitigate much of the dust. .

Heritage and Cultural Resources

Alternative 1 would produce no direct effects to any cultural or heritage resource. However, because fire risk is increased for Alternative 1, the risk for loss or degradation of cultural resources from high-intensity wildfire is also increased.

The action alternatives would protect heritage and cultural resources through both passive and active methods. Passive methods are to flag and avoid cultural or heritage sites. Active methods include hand thinning to reduce the risk of damage from high-intensity wildfire and removal of conifer encroachment in aspen stands to reduce competition for aspens with arborglyphs.

Scenic Resources

The No Action alternative would not produce direct effects to any scenic resource. However, because fire risk is increased for Alternative 1, the risk for loss or degradation of scenic views from high-intensity wildfire is also increased. Long term and indirect effects of the No Action alternative could result in a decrease in the presence of valued scenic attributes, and may result in failure to meet visual quality objectives (VQOs).

During vegetation treatment activities in both action alternatives, mechanical equipment or hand crew activities would cause a visual impact that exceeds VQO standards, but these activities would occur within short time durations. Clearing for landing areas is also considered a short-term impact to VQOs. These areas would meet VQOs following restoration measures and one to three years of vegetative growth.

Burn piles would remain in the landscape for one to three years following their creation and would meet the VQO of Retention or Partial Retention after they were burned. While smoke associated with prescribed burning of hand treated piles would have an effect on air clarity, this effect is also limited in scope and of short duration.

An indirect effect of implementing either action alternative would be increased viewing distances through more open forest stands. Views that were previously blocked by dense vegetation may become visible following treatment activities. This is likely to result in positive visual effects, such as revealed views of Lake Tahoe or surrounding landforms, and in negative visual effects, such as exposed views of neighborhoods or community infrastructure.

Implementation of either action alternative would have an indirect benefit to the scenic stability of the project analysis area. The reduced probability of landscape-scale tree mortality would increase the likelihood that the area would maintain compliance with Forest Plan VQOs. Additionally, the removal of conifers from aspen stands, meadows and riparian corridors would help perpetuate these scenic landscapes into the future. Any visual impacts to water clarity resulting from any sedimentation and erosion associated with treatment activities are anticipated to be short lived or non-evident.

Historically the landscape within the project area experienced more frequent surface fires which resulted in a more open forest character compared to current conditions. The effects of implementing the vegetation treatments in either action alternative would mimic these historic conditions and would be consistent with the Forest Plan VQOs of Retention and Partial Retention. Cumulative effects of implementing either action alternative would build on previous treatments and result in change to the landscape of the WUI that would improve scenic stability over the next 10 to 25 years.

Recreation

The No Action alternative would result in no short term or direct effects to the recreation resources, access or quality of recreation experience within the project area. Existing patterns of recreation use would be expected to remain, and to increase in volume over time. The potential for establishment of user-created trails remains, as does the potential for wildfires being started by legal or illegal recreation campfires. However, because fire risk is increased for Alternative 1, the risk for loss of recreation site infrastructure and loss of recreation opportunities from high-intensity wildfire is also increased.

A short-term direct effect during project management activities for both action alternatives would be temporary area closures implemented to protect the public from safety hazards associated with tree removal and operation of mechanical equipment. During fuels management activities trucks and other equipment would be utilizing public travel routes and have the potential to increase

traffic congestion and negatively affect the driving experience of highway users. Since “driving for pleasure” is an identified recreation use within the project area, this user group, as well as those traveling to recreation destinations could be affected. Landing or staging areas associated with mechanical treatment units that are located near residential roads, especially those roads that provide public access to general forest areas, would alter the visual landscape and the experience of those recreating in these areas during and immediately following treatment.

No changes to the Recreation Opportunity Spectrum classification are anticipated as a result of implementing either Alternative 2 or Alternative 3. Effects from Alternative 3 would be slightly less due to fewer acres treated, fewer trucks needed, and fewer roads and landings used.

Transportation

Alternative 1 would maintain the existing condition of the transportation system, including two existing stream crossings that are currently blocking water flow and fish passage.

There would be no new permanent road construction under either action alternative. Both action alternatives would replace and improve two stream crossings currently blocking water flow and fish passage. The majority of South Shore project effects would be short-term, and occur during the 5-8 years of project implementation. Road maintenance and reconstruction would create ground disturbance that would be additive to other ongoing activities from other projects on both federal and private ownerships. Initial activities to maintain or create road surfaces would increase the potential for sediment creation, while improvements to both existing road surfaces and existing stream crossings would reduce the potential for sediment transport. The net effect is likely to be neutral or positive over the long term, because the improvements to road surface and stream crossings would be permanent, and the decommissioning and stabilization of temporary roads would reduce the potential for ongoing effects from these roads. Because Alternative 2 would call for approximately four more miles of temporary road mileage than Alternative 3, road impacts and cumulative impacts would be less for Alternative 3.

Social and Economic

The No Action alternative would produce no direct costs or benefits. However, because fire risk is increased for Alternative 1, the risk for loss of existing economic values along with the risk for accumulating fire suppression costs from high-intensity wildfire is increased.

Alternative 2 present value cost was estimated to be \$12,233,000. The present net value for Alternative 2 was estimated at \$-3,334,000 and a benefit-cost ratio of 0.73, which indicates that the project costs would exceed the value of commercial products. As this alternative produces revenues from thinning only, values generated from the sale of generally smaller trees would not cover the costs associated with tree removal and extensive cleanup of slash and past tree mortality.

For Alternative 3, present value revenue was estimated to be \$6,942,000. The present net value for Alternative 3 was estimated at \$-8,674,000 and a benefit-cost ratio of 0.44, which indicates that project costs would exceed the value of the commercial timber by a larger factor than in Alternative 2. As this alternative also produces revenues from thinning only, values generated from the sale of generally smaller trees would not cover the costs associated with tree removal, extensive slash cleanup, and cleanup from past tree mortality. Alternative 3 would increase cut-to-length harvesting over whole tree harvesting compared to Alternative 2. Cut-to-length harvesting systems are more expensive than whole tree systems, and when combined with fewer total acres of mechanical harvesting in Alternative 3, the ratio of costs to revenues is higher in Alternative 3.

The cumulative effects of either action alternative would include the maintenance costs associated with the various treatments. Maintenance of treatments within the defense zone of the wildland urban interface is estimated to cost \$13,956,000. These treatments could be needed in twenty years where understory trees regenerate causing live fuel build up in the form of fire ladders. Maintenance treatments would consist of thinning or understory burning. The projected cumulative impacts of this project when combined with other projects would be to further increase employment and contracts to accomplish this work.

Indirect effects of the action alternatives are additional public benefits such as local employment, income generated from the forest products industry, and energy from local cogeneration plants.

Alternative 2 would create an estimated 25 full time jobs for timber industry employment during implementation. Based on a medium income of \$70,516 for El Dorado County residents (US Census 2000, adjusted to 2006), the total employment-related income for Alternative 2 would be \$1,762,900. During implementation, Alternative 3 would create an estimated 21 full time jobs for direct and induced employment. The total employment-related income for Alternative 3 would be \$1,481,000.

Environmental Justice

Adverse environmental or human health conditions created by any of the alternatives would not disproportionately affect any minority or low income neighborhood. The activities proposed in all alternatives were based solely on the existing and desired condition of the vegetation, sensitivity of the environment, and practical treatment access in response to the purpose and need. In no case was the treatment prescription design based on the demographic makeup, occupancy, property value, income level or any other criteria reflecting the status of adjacent non-federal land.

Monitoring Strategy

The purpose of project monitoring is to track the implementation of the resource protection measures found in Chapter 2 with the prescribed BMPs, and to measure their effectiveness in protecting resources. Monitoring is critical for evaluating the effectiveness of management decisions and the accuracy of analysis assumptions and conclusions. It is also important for a monitoring strategy to meet two essential criteria: (1) be helpful in making effective management decisions in the future, and (2) be feasible to implement.

Chapter 4 describes the monitoring that is required specific to the South Shore project. The description of monitoring is organized by resource. When a change in monitoring would be required by a difference between the action alternatives, a discussion of differences between alternatives is included. Specific resource areas for which monitoring would occur are:

- Soil, Water and Riparian Resources Monitoring
- Aquatic Resources Monitoring
- Transportation Monitoring
- Sensitive Plant Monitoring
- Invasive Weed Monitoring

Types of Monitoring

Implementation monitoring consists of visual monitoring of project treatment areas, roads, stream crossings, landings, etc., to ensure that all management practices and project resource protection measures (termed “design features” in the DEIS) are implemented, including those designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, riparian buffers, waterbars, critical dips) are in place as prescribed.

Effectiveness monitoring consists of visual monitoring to evaluate the effectiveness of the prescribed resource protection measures and management practices at meeting their objectives. It includes evaluating the effectiveness of management practices designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, riparian buffers, waterbars, critical dips).

Required Monitoring for Soil, Water, and Riparian Resources

- *SEZ Pile Burning*
- *BMP and Resource Protection Measure Implementation*
- *BMP Evaluation Program*
- *Additional BMPEP Monitoring*
- *Forensic Monitoring*

Required Monitoring for Aquatic Resources

- *Stream Temperature and Shade*

Required Monitoring for Transportation

- *Storm Water Pollution Prevention Program*

Required Monitoring for Sensitive Plants and Fungi

- *NRIS Database*

Monitoring related to Invasive Weeds

- *NRIS Database*

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